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# A New Anophthalmic *Trechiama* (Coleoptera, Trechinae) from the Southeastern Tip of Shikoku, Southwest Japan

*With 3 Text-figures*

Shun-Ichi UÉNO

*Department of Zoology, National Science Museum (Nat. Hist.), Shinjuku, Tokyo 160, Japan*

ABSTRACT A new anophthalmic species of the trechine genus *Trechiama* is described from an abandoned mine adit and a wave-cut cave at the southeastern tip of the Island of Shikoku, Southwest Japan. Though geographically much isolated, this new species bears a close similarity to the members of the group of *T. ohshimai* and is tentatively placed in that species-group. The new name given is *Trechiama* (s. str.) *sonei*.

In the late spring of 1981, a group of biospeologists made a collecting trip to the caves and mine adits in the eastern part of the Island of Shikoku, Southwest Japan. On the way from Kôchi to Tokushima, they dropped into the famous wave-cut cave called Mikuro-dô, which lies at the tip of Cape Muroto-zaki jutting out into the Pacific at the southeastern end of the island. This cave is regarded by Buddhists as a sacred place, and lying on the seashore, abounds with such littoral animals as large isopods and amphipods. It has been rather frequently visited by biologists but has never yielded truly cave-dwelling animals before. On that particular occasion, however, an individual of an anophthalmic trechine beetle emerged in the right-hand recess of the cave and was met by NISHIKAWA from under a piece of rotten board.

To my utmost surprise, this trechine was very similar to the members of the group of *Trechiama ohshimai*, whose distributional range theretofore known was limited to the areas surrounding Lake Biwa-ko at the northern part of the Kinki District (cf. fig. 69 in UÉNO, 1980, p. 267). Cape Muroto-zaki is more than 200 km distant to the southwest in a bee-line from the southwestern edge of that range, and is almost 70 km distant to the south even from the nearest known locality of any *Trechiama* (cf. fig. 4 in UÉNO, 1975, p. 211). Unfortunately, the single specimen of the trechine beetle then known was a female, and subsequent trappings attracted

only three more specimens of the same sex.

Three months later, however, another habitat of the *Trechiama* was discovered in an abandoned adit of a copper mine, located on the same cape about 180 m above Mikuro-dô. Only a few specimens were taken by hand, but trappings were very successful, bringing forth nearly two dozens of insects including many males. It became evident from the examination of their aedeagi that the trechine was a new species not belonging to any complexes previously known in the group of *T. ohshimai*, though it might still be included in that species-group.

It is difficult to elucidate how such an isolated population of the new *Trechiama* was established. In view of the importance of introducing it into science, however, I am going to describe the new species in the present paper under the name of *Trechiama sonei*. The abbreviations used herein are the same as those explained in my previous papers (*e.g.*, UÉNO, 1980, p. 196).

***Trechiama*** (s. str.) ***sonei*** S. UÉNO, sp. nov.

[Japanese name: Muroto-mekura-chibigomimushi]

(Figs. 1–3)

Length: 4.70–5.60 mm (from apical margin of clypeus to apices of elytra).

Externally similar to *T. suzukaensis* S. UÉNO (1980, pp. 203, 254, figs. 61–64) of the Suzuka Mountains, but the fore body is obviously smaller, the head is less transverse, with less convex genae and longer antennae, the prothorax is more regularly cordate and more strongly contracted both at apex and at base, the elytra are more strongly convex and usually shorter, with shorter scutellar and shallower apical strioles, the proximal dorsal pore of the external series is more distant from base, and the legs are slenderer. Decisively different from *T. suzukaensis* and its relatives in the conformation of male genitalia, above all in the disposition of the inner armature.

Colour as in *T. suzukaensis*, brown to dark reddish brown, shiny, more or less iridescent on elytra; palpi, apical segments of antennae, epipleura and legs yellowish brown.

Head subquadrate, about as wide as long, with frontal furrows less strongly arcuate behind than in *T. suzukaensis*; meshes of microsculpture finer and more transverse than in *T. suzukaensis*; genae less convex or rather flat, with shallower neck constriction behind; labrum shallowly emarginate at apex, with the median portion either straight or slightly produced; mentum tooth either simple or slightly emarginate at the tip; antennae longer and slenderer than in *T. suzukaensis*, reaching apical fourth of elytra, with segments 8–10 each well more than four times as long as wide.

Pronotum cordate and convex, widest at about two-thirds from base, and equally narrowed in front and behind, with the sides strongly arcuate in front, deeply sinuate at about one-fifth or two-ninths from base, and then either subparallel

or slightly divergent towards hind angles, which are either rectangular or a little sharp and hardly produced outwards; PW/HW 1.36–1.52 (M 1.45), PW/PL 1.09–1.18 (M 1.13), PW/PA 1.41–1.57 (M 1.51), PW/PB 1.33–1.45 (M 1.40); base more or less wider than apex, slightly but widely emarginate, PB/PA 1.03–1.12 (M 1.08); front angles narrow and obtuse, hardly produced; microsculpture formed by fine transverse lines, though rather irregular and partially obliterated.

Elytra ovate and rather strongly convex, though more or less depressed in basal fourth, widest at about middle, and more regularly narrowed towards apices than towards bases; EW/PW 1.63–1.76 (M 1.69), EL/EW 1.48–1.58 (M 1.52); microsculpture formed by fine transverse lines though not sharply impressed; humeral parts as in *T. suzukaensis*, with distinct shoulders; sides either straight or slightly emarginate behind shoulders, then gently arcuate to near apices, which are subtruncated and form a small re-entrant angle at suture; preapical emargination on each side distinct though not deep; striae rather deeply impressed throughout, more or less crenulate, scutellar striole very short though distinct, apical striole continuous to stria 5 and not particularly deep; intervals slightly convex on the disc; stria 3 with two setiferous dorsal pores at 1/9–1/7 and 1/3–4/9 from base respectively; stria 5 also with two setiferous dorsal pores at 2/11–2/9 and 1/2–5/8 from base respectively, the anterior pore being at a level obviously posterior to that on stria 3.

Legs evidently slenderer, though hardly longer, than in *T. suzukaensis*.

Male genital organ small and rather lightly sclerotized. Aedeagus about one-third as long as elytra, hardly arcuate at middle, thickest at the level of the proximal part of apical orifice, and rapidly flattened towards apex, with a longitudinal carina on the median line in apical half of the ventral surface; basal part elongate, only a little curved towards the ventral side, and devoid of sagittal aileron; basal orifice large, with the sides shallowly emarginate; apical lobe fairly long and curved ventrad, very narrow and blunt at the extremity in lateral view, gradually narrowed towards narrowly rounded extremity in dorsal view; in profile, ventral margin slightly convex at middle but widely concave before apex. Inner sac armed with three patches of heavily sclerotized teeth but devoid of copulatory piece; left lateral teeth-patch, the largest of the three, composed of particularly large teeth; right teeth-patch dorso-lateral, large though smaller than the left lateral, lying at the right side of the latter; apical teeth-patch ventral and small. Styles rather short, left style obviously larger than the right, each usually bearing four setae at apex though a fifth seta frequently occurs on the left style, rarely on the right.

*Type-series.* Holotype: ♂, allotype: ♀, Daihô Mine, 7–XI–1981, S. SONE leg. (found in baited traps set by S. UÉNO, K. ISHIKAWA, T. MOHRI & S. SONE on 25–VIII–1981) (NSMT). Paratypes: 1♂ (teneral), Daihô Mine, 25–VIII–1981, T. MOHRI & S. SONE leg. (NSMT); 7♂♂, 5♀♀, Daihô Mine, 7–XI–1981, S. SONE leg. (of these, 6♂♂ and 3♀♀ were found in baited traps set by S. UÉNO, K. ISHIKAWA, T. MOHRI & S. SONE on 25–VIII–1981) (NSMT); 10♂♂, 19♀♀, Daihô

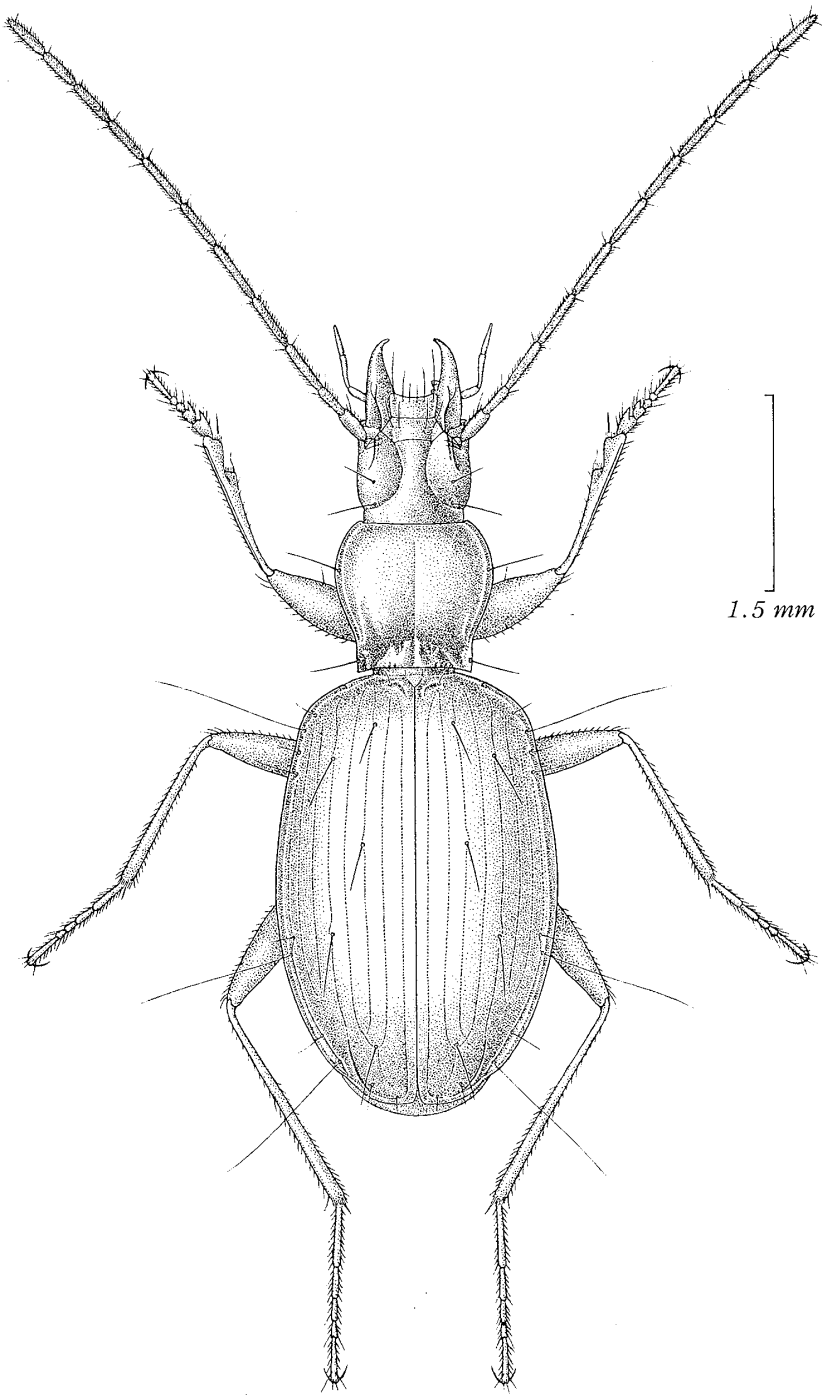
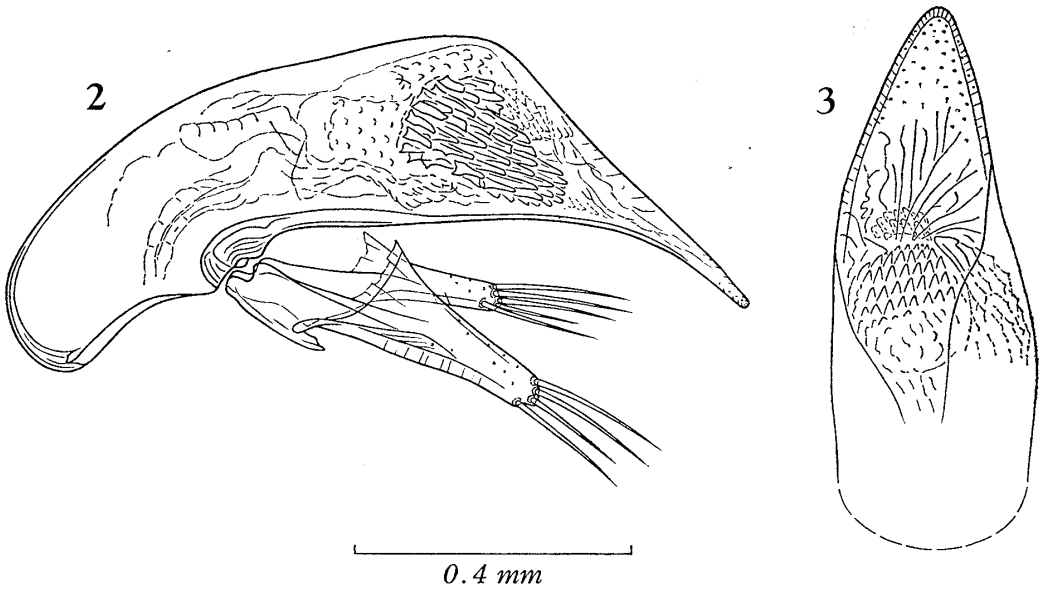



Fig. 1. *Trechiama* (s. str.) *sonei* S. UÉNO, sp. nov., ♂, from Daihô Mine at Cape Muroto-zaki.




Figs. 2–3. Male genitalia of *Trechiama* (s. str.) *sonei* S. UÉNO, sp. nov., from Daihô Mine at Cape Muroto-zaki; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

Mine, 22–II–1982, S. SONE leg. (found in baited traps set by S. SONE on 7–XI–1981) (NSMT); 2♂♂, 3♀♀, Daihô Mine, 28–III–1982, S. SONE leg. (found in baited traps set by S. SONE on 22–II–1982) (NSMT); 1♀, Mikuro-dô Cave, 18–V–1981, Y. NISHIKAWA leg. (NSMT); 3♀♀, Mikuro-dô Cave, 2–VIII–1981, S. SONE leg. (found in baited traps set by S. SONE on 18–V–1981) (NSMT).

*Localities.* Abandoned adit of the copper mine called Daihô-kôzan (type-locality!) and the wave-cut cave called Mikuro-dô, both at Misaki of Murotozaki-chô in Muroto-shi, Kôchi Prefecture, at the southeastern tip of the Island of Shikoku, Southwest Japan.

*Notes.* It is difficult to determine the true affinity of this interesting new species. In external morphology, it cannot be discriminated from the group of *T. ohshimai*, and is especially similar to *T. suzukaensis* S. UÉNO of the Suzuka Mountains. In genitalic features, however, it is markedly different from any known members of that species-group in the disposition of inner armature. It may have been derived from a common ancestor as *T. suzukaensis* and its close relatives, but the actual relationship between them does not seem very close. Though I have tentatively placed the species in the group of *T. ohshimai*, its systematic position should be reviewed if other species are discovered in the intervening area between Mt. Tsurugi-san and Cape Muroto-zaki.

As was already mentioned in the introduction of this paper, the known localities of the present species are very widely distant from the distributional range of *Trechiama* hitherto reported, and are completely isolated from that of the group of *T. ohshimai*. I have been unable to find any convincing opinion to account for

this discontinuity. A possibility, though slight, is that the ancestor of the present trechine was carried out to the Kii Channel by floods of certain large rivers, was washed up on the beach at the tip of Cape Muroto-zaki after drifting a long way on a raft of vegetable debris, and somehow established an isolated colony there.

The abandoned adit of Daihô-kôzan, which is designated as the type-locality of the present species, seems to have been dug into mudstone for prospecting. It is a kind of short tunnel bending at the middle, with two entrances in an evergreen broadleaved forest on either side of the ridge about 180 m above sea-level. Though mostly dry, it has an alcove at the bend, which contains a mass of wet rotten logs. All the known specimens of the trechine beetle were taken in this alcove, either from under stones and rotten logs or in baited traps set under large stones.

The other locality of the trechine, Mikuro-dô Cave, lies in a large outcrop of hornfels of acidic tuff origin. Its entrance is open at the foot of the same slope as the mine adit, and is only 400 m distant to the east by north from that of the latter. It is therefore probable that the two cavities are connected by some underground crevices passable for small-bodied cavernicoles. As was already noticed, Mikuro-dô Cave does not appear to offer a favourable habitat for terrestrial cavernicoles, so that the appearance of *T. sonei* in this wave-cut cave cannot be expected very frequently.

This interesting species is dedicated to Mr. Shinzaburo SONE, whose enthusiastic investigations enabled me to complete the present paper.

## ACKNOWLEDGEMENT

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